

Solvent-free oxidation of cyclohexane by oxygen over Al-Cu-Co
alloys: Influence of phase structure and electrical conductivity on
catalytic activity

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Table S2 EDX analysis in the selected points of Al₆₀Cu₅Co₃₅ alloy ingot profile

Figure S1 GC-MS spectra for liquid products of cyclohexane oxidation

Figure S2 Possible reaction mechanism of cyclohexane oxidation over Al-Cu-Co alloy

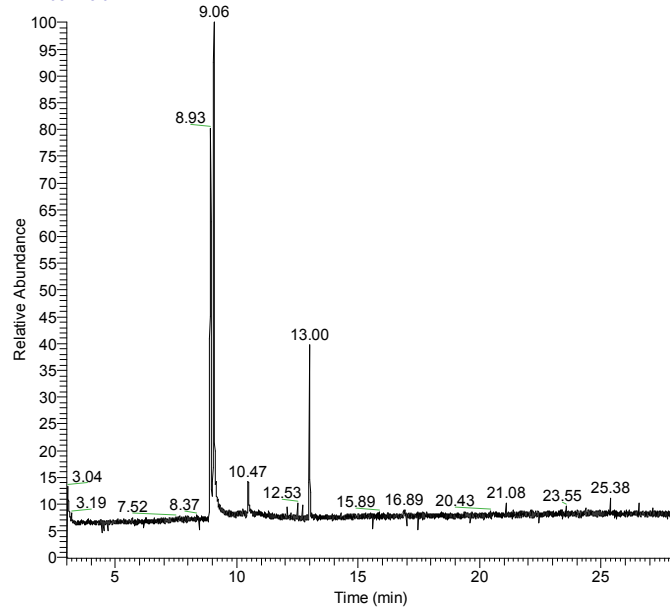
Table S1 Chemical composition of Al-Cu-Co alloys

Entry	Theoretical atomic ratio	Wt% (Actual)			Actual atomic ratio
		Al	Cu	Co	
1	Al ₇₀ Cu ₃₀	46.6	48.3	-	Al _{69.5} Cu _{30.5}
2	Al ₆₀ Cu ₄₀	36.0	56.3	-	Al _{60.1} Cu _{39.9}
3	Al ₅₀ Cu ₅₀	28.2	66.3	-	Al _{50.1} Cu _{49.9}
4	Al ₄₀ Cu ₆₀	22.1	72.9	-	Al _{41.6} Cu _{58.4}
5	Al ₇₀ Co ₃₀	51.7	-	45.7	Al _{71.2} Co _{28.8}
6	Al ₆₀ Co ₄₀	39.2	-	59.3	Al _{59.1} Co _{40.9}
7	Al ₅₀ Co ₅₀	30.9	-	69.1	Al _{49.4} Co _{50.6}
8	Al ₄₀ Co ₆₀	23.3	-	76.0	Al _{40.1} Co _{59.9}
9	Al ₆₅ Cu ₃₀ Co ₅	43.2	47.1	8.7	Al _{64.3} Cu _{29.8} Co _{5.9}
10	Al ₆₅ Cu ₂₅ Co ₁₀	43.5	41.2	14.4	Al _{64.4} Cu _{25.9} Co _{9.7}
11	Al ₆₅ Cu ₂₀ Co ₁₅	44.0	31.8	23.0	Al _{64.7} Cu _{19.9} Co _{15.4}
12	Al ₆₅ Cu ₁₅ Co ₂₀	43.7	24.4	29.2	Al _{64.8} Cu _{15.3} Co _{19.9}
13	Al ₆₅ Cu ₁₀ Co ₂₅	45.3	15.3	37.5	Al _{65.7} Cu _{9.4} Co _{24.9}
14	Al ₇₅ Cu ₁₀ Co ₁₅	51.6	16.8	25.5	Al _{73.3} Cu _{10.1} Co _{16.6}
15	Al ₇₀ Cu ₁₅ Co ₁₅	48.9	24.6	23.6	Al _{69.7} Cu _{14.9} Co _{15.4}
16	Al ₆₀ Cu ₂₅ Co ₁₅	38.2	37.7	21.0	Al _{59.8} Cu _{25.1} Co _{15.1}
17	Al ₅₅ Cu ₃₀ Co ₁₅	33.2	42.0	19.9	Al _{55.2} Cu _{29.6} Co _{15.2}
18	Al ₅₀ Cu ₃₅ Co ₁₅	29.5	49.3	18.1	Al _{50.2} Cu _{35.6} Co _{14.2}
19	Al ₆₅ Cu ₅ Co ₃₀	43.3	7.6	43.8	Al _{65.0} Cu _{4.9} Co _{30.1}
20	Al ₆₀ Cu ₅ Co ₃₅	38.8	7.6	50.7	Al _{59.5} Cu _{5.0} Co _{35.5}
21	Al ₅₅ Cu ₅ Co ₄₀	35.2	7.4	57.3	Al _{54.5} Cu _{4.9} Co _{40.6}
22	Al ₅₀ Cu ₅ Co ₄₅	30.9	7.1	61.1	Al _{49.9} Cu _{4.9} Co _{45.2}
23	Al ₄₅ Cu ₅ Co ₅₀	26.1	8.1	65.3	Al _{44.0} Cu _{5.7} Co _{50.3}

Table S2 EDX analysis in the selected points of Al₆₀Cu₅Co₃₅ alloy ingot profile

	Al (mol%)	Cu (mol%)	Co (mol%)	Total (mol%)
Red point 1	53.72	2.25	44.03	100
Red point 2	54.20	2.15	43.65	100
Red point 3	54.39	2.36	43.25	100
Average value	54.11	2.25	43.64	100
Red point 4	69.64	4.44	25.92	100
Red point 5	68.78	4.78	26.44	100
Red point 6	70.11	4.89	25.00	100
Average value	69.51	4.70	25.79	100
Total average value	61.81	3.48	34.71	100

RT: 2.98 - 28.04

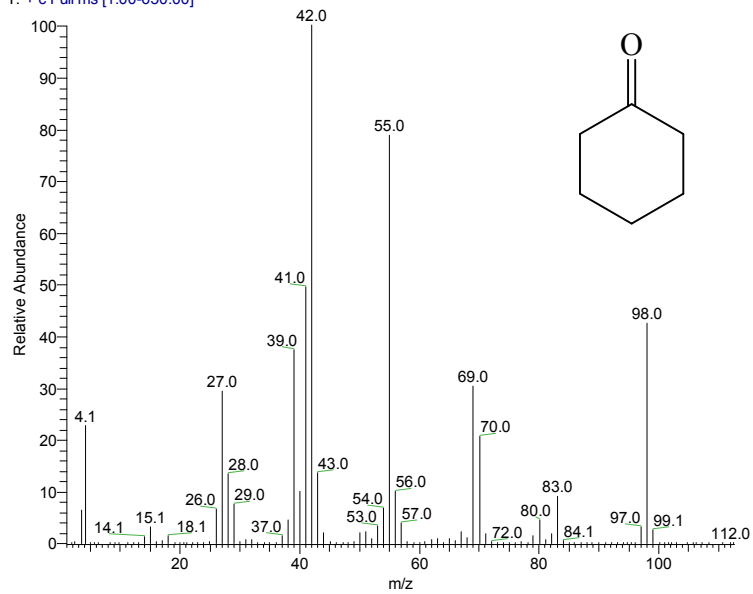


NL: 2.18E8
TIC MS
haojianmin_170401180
129

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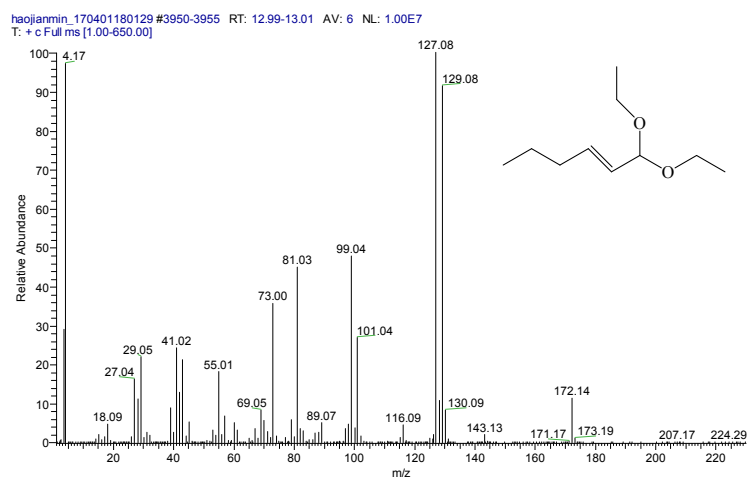
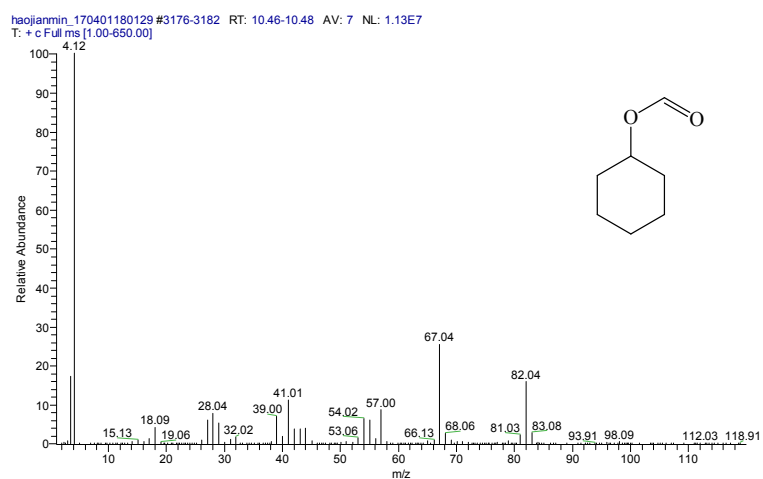


Figure S1 GC-MS spectra for liquid products of cyclohexane oxidation

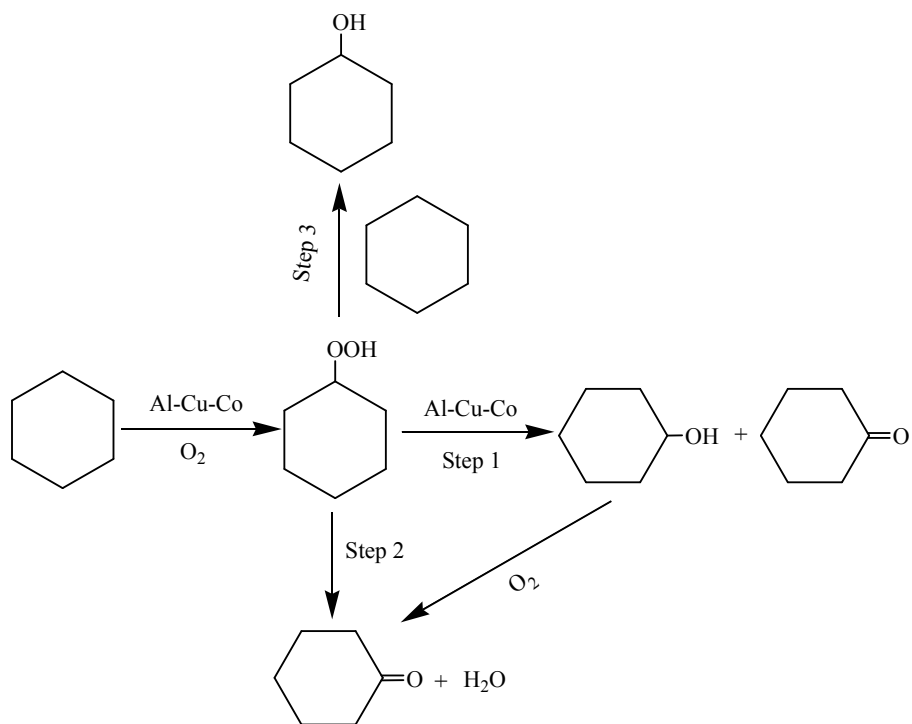


Figure S2 Possible reaction mechanism of cyclohexane oxidation over Al-Cu-Co alloy.